Kobuk River Test Fishing Project, 1996

By

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INTRODUCTION

The Kobuk River originates on the south side of the Brooks Range in the Arrigetch Mountains inside the Gates of the Arctic National Park. The river flows roughly 500 river miles west where it terminates at Kobuk Lake. The lower two-thirds of the river is stained by tannin from primarily the Pah River, an upper river tributary. Five villages are located on the Kobuk River and all depend on chum salmon for subsistence use. Residents of Kotzebue also depend on Kobuk River chum salmon as a subsistence resource. The Kobuk River is also thought to support up to 60% of the commercial catch of chum salmon in the Kotzebue District.

This was the fourth consecutive year a drift gillnet test fishing project operated in the lower Kobuk River (Lingnau, 1993; Lingnau, 1994; Lingnau, 1995). Because of the Kobuk River's tannic stain, test fishing is less susceptible to net avoidance by salmon than clear water systems. The only previous salmon project in the Kobuk River drainage was a counting tower site on the Squirrel River, which was too distant to provide timely information for fisheries management. This report presents the results of the fourth year of the Kobuk River drift test fishing project.

Management of the Kotzebue District commercial salmon fishery, particularly during the month of July, is dependent primarily on comparing commercial fishing period and cumulative season catch statistics to those of prior years. The drift test fishing project was initiated because of the need for an inseason index of run timing and abundance for Kobuk River chum salmon stocks, which largely support the first portion of the salmon migration into the Kotzebue District. While test fishing is a relatively low cost approach, it can also be susceptible to inter-annual variability in catch rates which typically requires the data be interpreted in a somewhat qualitative way as an abundance index if calibration is not possible between years.

The objectives of the test fishing project for 1996 were:

1. To continue to evaluate the feasibility of indexing chum salmon abundance in the Kobuk River using systematic drift gill net catches.

2. Describe the migratory timing for chum salmon in the lower Kobuk River.

3. Sample for age, sex and size.

In addition, a long term goal of the project, once sufficient historical data are available for comparison, is to assess, in a qualitative way, the impact of the Kotzebue District commercial salmon fishery on chum salmon abundance in the lower Kobuk River for fisheries management purposes. Primary fishery management objectives are to provide for an adequate chum salmon escapement through the commercial fishery: (1) to ensure sustained runs by allowing adequate escapement, and (2) to meet subsistence harvest needs.

METHODS

Site Description

The site is approximately 70 river miles from the Kobuk Lake commercial salmon fishing district boundary markers (Figure 1). This is the furthest downstream site where the river runs through a single channel and is below all spawning tributaries which support spawning chum salmon. The test fishing site was also selected because of it's desirable stream characteristics. The site consists of roughly a 1 mile river section located approximately 3 miles downstream from Kiana. The width of the river was approximately 300 meters and was divided into two sites (Figure 2). Site N is the north side of the river (right bank), which is the cut bank side of the river with the swiftest current. Site S is located on the south side of the river (left bank). Site S is located downstream from a major sandbar and has a gradual gradient. It is also the site with the slowest current. A bottom profile at the test fish site this year revealed a near uniform bottom with a depth of 6 meters. The deepest portion of the river was in the first quarter from the right bank (Figure 3).

Test Fishing

Fishing was scheduled to sample salmon passage during three different segments of the day at each of the two sites; morning (0800), mid-day (1500), and late evening (2200). Drifts were conducted by a two person crew, six days per week. During the peak of the run, drifts were conducted every day of the week.

All test fishing drifts were made from a 20 foot open outboard motorboat for no more than 20 minutes with a 50 fathom gill net. If catch rates were high, fishing time was reduced in order to control mortality. The net was composed of 6 inch (15.2 cm) stretched mesh multifilament webbing, 40 meshes deep, and hung at a ratio of 2:1. Age-sex-length data were collected from up to 80 chum salmon per day. Mortalities were primarily given to elders but some were given to other individuals for subsistence purposes. The availability of chum salmon was announced over the CB radio.

Standardized Catches

Actual catches were converted to catch per unit of effort (CPUE) by considering fishing time and the length of net used. Each CPUE index was the number of fish which would have been caught if 100 fathoms of net had been fished for 60 minutes. The index (I) was calculated as follows:

$$I = \frac{6{,}000\,(c)}{(l)\,(t)}$$

Where: c = number of chum salmon caught
l = length of net in fathoms
t = mean fishing time in minutes

Mean fishing time (t) was defined as the amount of time the entire net was fishing plus half the time it took to deploy and retrieve the net. Mean daily drift CPUE indices were calculated using the sum of the total time fished and total fish caught for each day. The mean daily indices were summed to produce total seasonal CPUE indices for the period of data collection. Cumulative proportions of seasonal total test fish CPUE indices were also calculated.

Catch rate for each time period and site was determined by using the fishing time and number of fish caught for those specific time periods and sites. Seasonal abundance by site and time period were indexed by summing CPUE indices for each of the daily sites and time periods. Temporal distribution was depicted as a percent calculated by dividing each time period total by the total CPUE indices. Spatial distribution was described by dividing each site's CPUE seasonal total by the total of both site's CPUE indices. Temporal and spatial distribution are described as a percent since the number of drifts made at each site and the amount of time fished varied.

RESULTS

Drifting began on July 9 and continued through August 14. CPUE indices were calculated for each drift and site (Table 1). There were 2,053 chum salmon caught in a total of 208 drifts (104 drift time periods) producing 7,675.4 chum salmon drift period CPUE index points (Table 6). The peak catch and CPUE occurred on August 1 with a catch of 153 salmon, which was a daily CPUE of 167.67 (6.5% of the seasonal CPUE index). Totals of 32.4, 37.2 and 30.3 percent of the seasonal CPUE indices were caught at 0800, 1500, and 2200 hours (Table 4). Totals of 27.3 and 72.7 percent of the total seasonal CPUE indices were caught at sites N and S. Passage by site was nearly identical to 1993 with almost 75% of the salmon being caught on the south side. Passage by time of day was consistent with previous years, with a characteristically slightly higher catch rate in the afternoon (non-statistical comparison, nsc) (Table 5). The mean secchi for 1996 was 2.1 meters, also identical to 1993.

There were 1,633 aged chum salmon scales from test net samples.). Enough scale samples were taken to stratify age and sex composition by week (Table 7.) The age composition was 0.5% Age-0.2, 31.9% Age-0.3, 58.4% Age-0.4, 8.9% Age-0.5 and 0.3% Age-0.6 (Table 8 The age composition of the 1996 Kotzebue commercial and Noatak River drift test fish catch is shown for comparison. Length by age comparison (nsc) indicates that females sampled from the Kobuk River test fish catch were larger than the Kotzebue commercial catch and Noatak River test fish samples, but males were in most cases similar in size. Chum salmon samples from the Noatak River and Kotzebue commercial catch were in general similar in size by age class. Age and length samples were caught with similar gear. Samples from the Kobuk and Noatak Rivers were from 6 inch mesh while commercial gear is 5-7/8 or 6 inch mesh gillnet.

The test fishing methods for the Kobuk River project were set up the same as they had been in the prior three years. The test fishing gear was intended to match the gear typically used in the commercial fishery. Two days of test fishing were missed due to regular days off. Seasonal test fishing data for 1993-1996 are presented in Tables 2, 3, 5 and 6, and in Figures 4 through 6.

Figure 4 shows test fishing CPUE by day for 1993-1996. Figures 5 and 6 compare cumulative CPUE and cumulative proportions of CPUE indices. Climatological data are presented in Table 9 and Figure 7.

The test fishing CPUE indices generated (number of salmon caught) can be influenced considerably by normal commercial fishing activity in Kotzebue Sound, as well as the number of drifts conducted and their timing compared to commercial periods. In addition, local salmon migration patterns can be greatly influenced by weather conditions. For these reasons, no interpolations were made for missing data points since the accuracy of these estimates may not be reliable.

CONCLUSIONS

The Kobuk River test fishing project was successful in it's fourth year of operation. Water clarity and level conditions this year varied from high and muddy to low and clear. The tannic staining of the river reduced salmon net avoidance significantly during periods of low water and provided a comparable catch rate throughout the season. The tannic stain provides concealment of the gillnets so that the ability to catch fish throughout the run remains constant. This allows comparability within years and between years.

Short and sometimes infrequent commercial openings had little effect in the test fishery daily catch rate that is sometimes caused by a standard fishing schedule in the commercial fishery near Kotzebue. This created a smoother curve in the daily and cumulative catch rate graphs. Therefore, there were no pronounced fluctuations in the test fishery data with which to evaluate the time of the migration from the commercial fishery to the test fish site. Previous information from department projects and local residents indicate it is between 5-6 days.

Local subsistence fishermen were interviewed throughout the season by the test fish crew. Catch rates from the test fishery seemed to track with subsistence catches early in the season. Because of the strong run and the saturation of salmon into the community from the test fish project, most subsistence fishers near Kiana met their needs quickly and had taken their nets out of the water. The test fish crew, for the first time, had problems giving fish away as the season progressed. This is an indication that the test fish project is filling a large portion of subsistence fish needed by the residents of Kiana.

The project was run as long as the budget would allow. It's six week duration is believed to have covered most of the migration. However, strong catch rates at the onset of test fishing and at the end of the project indicate portions of the run were missed. Even though record early subsistence harvests occurred near Kotzebue this year, spawn timing by aerial surveys was normal. The cumulative proportion graph also indicates an early entry of chum salmon.

Aerial surveys again corroborated the assessment based on high cumulative catch rate by test fishing. In 1993, escapement goals were just met by aerial survey. That year, the cumulative index for the Kobuk River test fishery was 494. In 1994, no aerial surveys were flown due to

weather. The cumulative index for 1995 was 1,188, a little more that twice that of 1993. Results in 1995 were that escapement goals by aerial survey were also roughly doubled. The cumulative index for 1996 was 2,581, about 5 times that of 1993. In general, escapements for the Kobuk River tributaries, with the exception of the Squirrel River, were also four to five times the goal by aerial survey. During these years, water conditions have ranged from low and clear to high and muddy between years and within years. Fluctuation of catch rates due to water clarity seems minimal for the years of 1994-1996 (Figure 8). Commercial catch rates, when comparable, have also agreed with the escapement comparisons. Test fishing on the Kobuk River at the current drift gillnet site near Kiana is feasible, providing usable escapement indexing information in a cost effective manner. The project has proven itself, in the author's opinion, providing useful chum salmon run timing and index of abundance information for managers. This project could be used as a management tool in future years when the Kotzebue commercial fishery once more becomes competitive.

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Table 1. Kobuk River drift test fish chum salmon CPUE by day, drift and site, 1996. [a]

Date	CPUE by Drift [b]			CPUE by Site [c]		Daily CPUE	Cum.. CPUE
	#1	#2	#3	N	S		
09-Jul		7.66	17.87	0.00	25.00	12.77	12.77
10-Jul	5.16	21.10	19.09	0.00	28.94	15.00	27.77
11-Jul	78.14	103.26	122.11	41.90	172.50	98.38	126.15
12-Jul	88.42	32.20	38.40	36.57	56.00	45.54	171.69
13-Jul	61.94	97.22	66.00	10.29	154.29	74.29	245.98
14-Jul [d]							245.98
15-Jul	100.65	52.94	100.65	32.43	154.07	83.75	329.73
16-Jul	50.15	82.29	85.00	27.17	130.63	71.35	401.08
17-Jul	93.66	34.29	56.73	10.00	112.21	55.49	456.57
18-Jul	59.18	98.31	117.82	58.32	122.31	89.86	546.43
19-Jul	69.82	61.18	36.92	28.70	85.06	54.74	601.17
20-Jul	70.34	69.82	48.70	47.44	82.11	63.70	664.87
21-Jul	66.67	45.71	47.41	19.46	93.79	52.12	716.99
22-Jul	27.59	72.33	58.18	28.72	74.86	50.97	767.96
23-Jul	52.99	142.86	105.26	38.79	158.96	91.36	859.32
24-Jul	62.77	100.30	122.79	46.06	151.58	91.89	951.21
25-Jul	30.00	157.71	16.84	22.98	139.26	76.80	1,028.01
26-Jul	113.21	5.22	27.69	17.45	85.71	55.68	1,083.69
27-Jul	15.24	19.59	72.73	3.93	48.57	29.79	1,113.48
28-Jul	52.00	83.81	8.28	10.55	88.00	49.06	1,162.54
29-Jul	110.00	77.29	20.43	118.48	19.20	70.13	1,232.67
30-Jul	51.06	36.00	22.86	32.00	39.00	35.29	1,267.96
31-Jul	71.25	120.00	59.13	100.00	64.90	82.27	1,350.23
01-Aug	122.18	252.24	80.00	41.63	269.75	167.67	1,517.90
02-Aug	120.00	30.55	28.47	42.62	91.27	62.02	1,579.92
03-Aug	76.67	60.85	3.75	22.07	68.00	48.70	1,628.62
04-Aug	52.00	25.95	145.00	40.56	82.16	65.93	1,694.55
05-Aug	53.79	40.75	80.00	2.76	112.50	60.33	1,754.88
06-Aug	44.08	43.28	148.00	56.10	100.65	80.47	1,835.35
07-Aug	136.30	57.60	51.76	144.00	49.41	90.99	1,926.34
08-Aug	94.55	221.77	98.82	105.37	176.84	146.94	2,073.28
09-Aug	120.00	133.33	66.46	15.00	172.36	106.11	2,179.39
10-Aug	32.54	98.57	42.58	5.33	110.34	56.95	2,236.34
11-Aug [d]							2,236.34
12-Aug	123.33	39.07	28.24	43.90	100.00	72.29	2,308.63
13-Aug	105.21	136.62	102.86	58.82	172.12	114.63	2,423.26
14-Aug	77.29	197.26	181.46	113.55	192.40	158.13	2,581.39

[a] Catch per unit effort is calculated in catch/100fm/hour

[b] Drift 1 begins at 0800, Drift 2 at 1500, Drift 3 at 2200.

[c] Site N is the North Bank (right bank), Site S is the South Bank (left bank).

[d] Regular Day Off

[e] End of the season, no drifts were conducted.

Table 2. Kobuk River chum salmon drift test fish mean daily and cumulative CPUE, 1993-1996 [a].

	1993		1994		1995		1996	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
05-Jul								
06-Jul								
07-Jul								
08-Jul								
09-Jul							12.77	12.77
10-Jul							15.00	27.77
11-Jul							98.38	126.15
12-Jul	11.18	11.18			0.00	0.00	45.54	171.69
13-Jul	14.22	25.40	0.00	0.00	0.93	0.93	74.29	245.98
14-Jul	20.57	45.97	2.68	2.68	2.80	3.73	[b]	245.98
15-Jul	35.08	81.05	2.58	5.26	2.77	6.50	83.75	329.73
16-Jul	13.19	94.24	11.35	16.61	[b]	6.50	71.35	401.08
17-Jul	17.27	111.51	[b]	16.61	0.00	6.50	55.49	456.57
18-Jul	[b]	111.51	7.16	23.77	1.81	8.31	89.86	546.43
19-Jul	10.71	122.22	12.40	36.17	9.89	18.20	54.74	601.17
20-Jul	2.76	124.98 +	3.65	39.82	16.30	34.50	63.70	664.87 +
21-Jul	3.20	128.18	7.30	47.12	38.54	73.04	52.12	716.99
22-Jul	5.52	133.70	3.56	50.68	21.18	94.22	50.97	767.96
23-Jul	27.15	160.85	16.49	67.17	50.58	144.80	91.36	859.32
24-Jul	9.06	169.91	[b]	67.17	28.46	173.26	91.89	951.21
25-Jul	[b]	169.91	14.38	81.55	40.16	213.42	76.80	1,028.01
26-Jul	15.22	185.13	47.65	129.20	35.15	248.57	55.68	1,083.69
27-Jul	8.06	193.19	40.66	169.86	63.94	312.51 +	29.79	1,113.48
28-Jul	16.36	209.55	57.83	227.69	62.49	375.00 .	49.06	1,162.54
29-Jul	0.93	210.48	33.62	261.31	46.11	421.11	70.13	1,232.67
30-Jul	0.92	211.40	69.21	330.52 +	57.86	478.97	35.29	1,267.96
31-Jul	12.58	223.98	[b]	330.52	29.89	508.86	82.27	1,350.23 *
01-Aug	[b]	223.98	82.16	412.68	72.91	581.77	167.67	1,517.90
02-Aug	6.74	230.72	65.12	477.80	48.71	630.48 *	62.02	1,579.92
03-Aug	54.49	285.21 *	71.79	549.59	48.40	678.88	48.70	1,628.62
04-Aug	44.23	329.44	108.98	658.57 *	53.00	731.88	65.93	1,694.55
05-Aug	89.30	418.74 +	59.74	718.31	49.95	781.83	60.33	1,754.88
06-Aug	18.60	437.34	102.56	820.87	[b]	781.83	80.47	1,835.35
07-Aug	20.52	457.86	[b]	820.87	46.39	828.22	90.99	1,926.34
08-Aug	[b]	457.86	62.75	883.62	44.02	872.24	146.94	2,073.28 +
09-Aug	1.84	459.70	96.86	980.48 +	68.22	940.46 +	106.11	2,179.39
10-Aug	12.63	472.33	45.83	1,026.31	56.33	996.79	56.95	2,236.34
11-Aug	18.11	490.44	57.02	1,083.33	37.95	1,034.74	[b]	2,236.34
12-Aug	3.74	494.18	90.54	1,173.87	63.92	1,098.66	72.29	2,308.63
13-Aug			11.36	1,185.23	[b]	1,098.66	114.63	2,423.26
14-Aug			[b]	1,185.23	29.35	1,128.01	158.13	2,581.39
15-Aug			5.13	1,190.36	25.26	1,153.27		
16-Aug			16.23	1,206.59	35.04	1,188.31		
17-Aug			0.00	1,206.59				
18-Aug			0.00	1,206.59				
19-Aug			3.12	1,209.71				
20-Aug			0.00	1,209.71				
21-Aug			[b]	1,209.71				
22-Aug			0.00	1,209.71				
23-Aug			0.00	1,209.71				
24-Aug			0.00	1,209.71				
25-Aug			0.91	1,210.62				
26-Aug			5.56	1,216.18				
27-Aug			1.86	1,218.04				
28-Aug			0.93	1,218.97				
29-Aug			0.00	1,218.97				
30-Aug			0.00	1,218.97				

[a] Quartiles are indicated by the "+" and the mid-points are indicated by a "*".

[b] Regular day off.

Table 3. Kobuk River chum salmon drift test fish daily and cumulative proportions, 1993-1996.

	1993		1994		1995		1996	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
05-Jul								
06-Jul								
07-Jul								
08-Jul								
09-Jul							0.005	0.005
10-Jul							0.006	0.011
11-Jul							0.038	0.049
12-Jul	0.023	0.023			0.000	0.000	0.018	0.067
13-Jul	0.029	0.051	0.000	0.000	0.001	0.001	0.029	0.095
14-Jul	0.042	0.093	0.002	0.002	0.002	0.003	[a]	0.095
15-Jul	0.071	0.164	0.002	0.004	0.002	0.005	0.032	0.128
16-Jul	0.027	0.191	0.009	0.014	[a]	0.005	0.028	0.155
17-Jul	0.035	0.226	[a]	0.014	0.000	0.005	0.021	0.177
18-Jul	[a]	0.226	0.006	0.020	0.002	0.007	0.035	0.212
19-Jul	0.022	0.247	0.010	0.030	0.008	0.015	0.021	0.233
20-Jul	0.006	0.253	0.003	0.033	0.014	0.029	0.025	0.258
21-Jul	0.006	0.259	0.006	0.039	0.032	0.061	0.020	0.278
22-Jul	0.011	0.271	0.003	0.042	0.018	0.079	0.020	0.297
23-Jul	0.055	0.325	0.014	0.055	0.043	0.122	0.035	0.333
24-Jul	0.018	0.344	[a]	0.055	0.024	0.146	0.036	0.368
25-Jul	[a]	0.344	0.012	0.067	0.034	0.180	0.030	0.398
26-Jul	0.031	0.375	0.039	0.106	0.030	0.209	0.022	0.420
27-Jul	0.016	0.391	0.033	0.139	0.054	0.263	0.012	0.431
28-Jul	0.033	0.424	0.047	0.187	0.053	0.316	0.019	0.450
29-Jul	0.002	0.426	0.028	0.214	0.039	0.354	0.027	0.478
30-Jul	0.002	0.428	0.057	0.271	0.049	0.403	0.014	0.491
31-Jul	0.025	0.453	[a]	0.271	0.025	0.428	0.032	0.523
01-Aug	[a]	0.453	0.067	0.339	0.061	0.490	0.065	0.588
02-Aug	0.014	0.467	0.053	0.392	0.041	0.531	0.024	0.612
03-Aug	0.110	0.577	0.059	0.451	0.041	0.571	0.019	0.631
04-Aug	0.090	0.667	0.089	0.540	0.045	0.616	0.026	0.656
05-Aug	0.181	0.847	0.049	0.589	0.042	0.658	0.023	0.680
06-Aug	0.038	0.885	0.084	0.673	[a]	0.658	0.031	0.711
07-Aug	0.042	0.927	[a]	0.673	0.039	0.697	0.035	0.746
08-Aug	[a]	0.927	0.051	0.725	0.037	0.734	0.057	0.803
09-Aug	0.004	0.930	0.079	0.804	0.057	0.791	0.041	0.844
10-Aug	0.026	0.956	0.038	0.842	0.047	0.839	0.022	0.866
11-Aug	0.037	0.992	0.047	0.889	0.032	0.871	[a]	0.866
12-Aug	0.008	1.000	0.074	0.963	0.054	0.925	0.028	0.894
13-Aug			0.009	0.972	[a]	0.925	0.044	0.939
14-Aug			[a]	0.972	0.025	0.949	0.061	1.000
15-Aug			0.004	0.977	0.021	0.971		
16-Aug			0.013	0.990	0.029	1.000		
17-Aug			0.000	0.990				
18-Aug			0.000	0.990				
19-Aug			0.003	0.992				
20-Aug			0.000	0.992				
21-Aug			[a]	0.992				
22-Aug			0.000	0.992				
23-Aug			0.000	0.992				
24-Aug			0.000	0.992				
25-Aug			0.001	0.993				
26-Aug			0.005	0.998				
27-Aug			0.002	0.999				
28-Aug			0.001	1.000				
29-Aug			0.000	1.000				
30-Aug			0.000	1.000				

[a] Regular day off.

Table 4. Kobuk River drift test fish chum salmon CPUE indices, mean CPUE and percent by drift (time of day) and site (location), 1996.

Drift Period	Season CPUE Indices	No. of Period Drifts	Season Mean CPUE	Percent	Station	Season CPUE Indices	No. of Site Drifts	Season Mean CPUE	Percent
1 0800 hr.	2,488.2	34	73.2	32.4	N North Bank	1,423.0	35	40.7	27.3
2 1500 hr.	2,858.9	35	81.7	37.2	S South Bank	3,784.8	35	108.1	72.7
3 2200 hr.	2,328.3	35	66.5	30.3					
Total	7,675.4	104	73.8	100.0		5,207.7	70	74.4	100.0

Table 5. Kobuk River drift test fish chum salmon diurnal and spatial distribution expressed as mean CPUE by drift period and by site, 1996-1996. [a]

Year	Mean CPUE by Drift Period			Yearly Mean CPUE	Percent Mean CPUE by Drift Period			Mean CPUE by Site		Yearly Mean CPUE	Percent Mean CPUE by Site	
	1	2	3		1	2	3	N	S		N	S
1993	13.0	21.3	15.9	16.8	25.4	43.4	31.1	10.0	24.9	17.4	28.7	71.3
1994	25.8	33.2	23.7	27.5	31.7	39.8	28.5	4.9	53.5	29.2	8.4	91.6
1995	29.4	37.6	38.7	35.0	29.6	34.7	35.7	25.2	48.2	36.7	34.3	65.7
1996	73.2	81.7	66.5	73.8	32.4	37.2	30.3	40.7	108.1	74.4	27.3	72.7

[a] Drift 1 begins at 0800, Drift 2 at 1500, Drift 3 at 2200. Site N is the North Bank (right bank), Site S is the South Bank (left bank).

Table 6. Kobuk River chum salmon drift test fishing CPUE and cumulative CPUE by drift, 1993-1996.

	1993			1994			1995			1996		
Date	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.
9-Jul										1		
										2	7.7	7.7
										3	17.9	25.5
10-Jul										1	5.2	30.7
										2	21.1	51.8
										3	19.1	70.9
11-Jul										1	78.1	149.0
										2	103.3	252.3
										3	122.1	374.4
12-Jul	1	15.5	15.5				1	0.0	0.0	1	88.4	462.8
	2	2.5	18.0				2	0.0	0.0	2	32.2	495.0
	3	16.0	34.0				3	0.0	0.0	3	38.4	533.4
13-Jul	1	5.4	39.4	1	0.0	0.0	1	0.0	0.0	1	61.9	595.4
	2	15.5	54.9	2	0.0	0.0	2	2.9	2.9	2	97.2	692.6
	3	25.4	80.3	3	0.0	0.0	3	0.0	2.9	3	66.0	758.6
14-Jul	1	13.2	93.5	1	0.0	0.0	1	2.8	5.7	1 [a]		758.6
	2	0.0	93.5	2	5.3	5.3	2	5.5	11.2	2		758.6
	3	46.1	139.5	3	2.6	7.9	3	0.0	11.2	3		758.6
15-Jul	1	20.6	160.1	1	5.0	12.8	1	5.6	16.8	1	100.7	859.2
	2	33.9	194.0	2	2.6	15.4	2	0.0	16.8	2	52.9	912.2
	3	46.5	240.5	3	0.0	15.4	3	2.8	19.5	3	100.7	1,012.8
16-Jul	1	2.7	243.2	1	5.1	20.6	1 [a]		19.5	1	50.2	1,063.0
	2	32.5	275.7	2	10.4	31.0	2		19.5	2	82.3	1,145.3
	3	2.7	278.5	3	18.9	49.9	3		19.5	3	85.0	1,230.3
17-Jul	1	23.5	302.0	1 [a]		49.9	1	0.0	19.5	1	93.7	1,323.9
	2	28.7	330.7	2		49.9	2	0.0	19.5	2	34.3	1,358.2
	3	0.0	330.7	3		49.9	3	0.0	19.5	3	56.7	1,414.9
18-Jul	1 [a]		330.7	1	2.6	52.5	1	2.8	22.3	1	59.2	1,474.1
	2		330.7	2	0.0	52.5	2	2.7	25.0	2	98.3	1,572.4
	3		330.7	3	18.5	71.0	3	0.0	25.0	3	117.8	1,690.2
19-Jul	1	5.5	336.1	1	23.7	94.7	1	0.0	25.0	1	69.8	1,760.1
	2	2.7	338.8	2	10.3	105.0	2	12.9	37.9	2	61.2	1,821.2
	3	23.5	362.3	3	2.8	107.8	3	16.2	54.1	3	36.9	1,858.2
20-Jul	1	2.8	365.1	1	2.9	110.6	1	10.8	64.8	1	70.3	1,928.5
	2	5.4	370.5	2	8.1	118.7	2	16.4	81.2	2	69.8	1,998.3
	3	0.0	370.5	3	0.0	118.7	3	21.8	103.0	3	48.7	2,047.0
21-Jul	1	2.8	373.2	1	10.8	129.5	1	39.1	142.2	1	66.7	2,113.7
	2	5.5	378.7	2	11.0	140.6	2	27.0	169.1	2	45.7	2,159.4
	3	1.9	380.6	3	0.0	140.6	3	49.0	218.2	3	47.4	2,206.8
22-Jul	1	2.8	383.4	1	5.5	146.0	1	20.7	238.8	1	27.6	2,234.4
	2	0.0	383.4	2	2.6	148.6	2	24.0	262.8	2	72.3	2,306.7
	3	13.2	396.6	3	2.7	151.3	3	18.9	281.7	3	58.2	2,364.9
23-Jul	1	2.7	399.3	1	24.8	176.1	1	53.1	334.7	1	53.0	2,417.9
	2	26.1	425.4	2	13.5	189.6	2	59.2	394.0	2	142.9	2,560.8
	3	51.6	477.0	3	11.2	200.8	3	37.7	431.7	3	105.3	2,666.0
24-Jul	1	8.2	485.2	1 [a]		200.8	1	39.1	470.7	1	62.8	2,728.8
	2	8.1	493.3	2		200.8	2	36.5	507.2	2	100.3	2,829.1
	3	10.9	504.2	3		200.8	3	10.9	518.1	3	122.8	2,951.9
25-Jul	1 [a]		504.2	1	24.3	225.0	1	16.2	534.3	1	30.0	2,981.9
	2		504.2	2	13.5	238.5	2	10.9	545.2	2	157.7	3,139.6
	3		504.2	3	5.4	243.9	3	109.4	654.6	3	16.8	3,156.4
26-Jul	1	10.9	515.1	1	32.7	276.6	1	20.6	675.2	1	113.2	3,269.6
	2	8.1	523.2	2	63.7	340.3	2	35.5	710.6	2	5.2	3,274.9
	3	26.4	549.6	3	44.7	384.9	3	47.4	758.0	3	27.7	3,302.6
27-Jul	1	15.5	565.1	1	21.3	406.3	1	50.2	808.3	1	15.2	3,317.8
	2	8.1	573.1	2	59.4	465.6	2	34.7	842.9	2	19.6	3,337.4
	3	0.0	573.1	3 [b]		465.6	3	102.9	945.8	3	72.7	3,410.1

(continued)

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	1993			1994			1995			1996		
Date	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.
28-Jul	1	11.2	584.3	1 [b]		465.6	1	39.4	985.2	1	52.0	3,462.1
	2	16.2	600.5	2 [b]		465.6	2	88.2	1,073.4	2	83.8	3,545.9
	3	21.6	622.1	3	57.8	523.5	3	67.9	1,141.3	3	8.3	3,554.2
29-Jul	1	2.7	624.8	1	34.3	557.7	1	48.8	1,190.0	1	110.0	3,664.2
	2	0.0	624.8	2	52.5	610.2	2	8.4	1,198.4	2	77.3	3,741.5
	3	0.0	624.8	3	19.3	629.6	3	85.1	1,283.5	3	20.4	3,761.9
30-Jul	1	0.0	624.8	1	83.1	712.6	1	67.1	1,350.5	1	51.1	3,813.0
	2	0.0	624.8	2	38.5	751.2	2	59.2	1,409.7	2	36.0	3,849.0
	3	2.8	627.5	3	82.0	833.1	3	48.6	1,458.3	3	22.9	3,871.8
31-Jul	1	16.2	643.7	1 [a]		833.1	1	49.0	1,507.4	1	71.3	3,943.1
	2	16.2	659.9	2		833.1	2	20.9	1,528.2	2	120.0	4,063.1
	3	5.4	665.3	3		833.1	3	19.1	1,547.3	3	59.1	4,122.2
1-Aug	1 [a]		665.3	1	51.4	884.5	1	61.5	1,608.8	1	122.2	4,244.4
	2		665.3	2	124.7	1,009.2	2	81.0	1,689.8	2	252.2	4,496.6
	3		665.3	3	67.2	1,076.4	3	76.9	1,766.8	3	80.0	4,576.6
2-Aug	1 [b]		665.3	1	27.0	1,103.4	1	45.0	1,811.8	1	120.0	4,696.6
	2	0.0	665.3	2	74.6	1,178.0	2	66.2	1,878.0	2	30.6	4,727.2
	3	13.3	678.6	3	92.8	1,270.8	3	35.5	1,913.4	3	28.5	4,755.7
3-Aug	1	42.2	720.8	1	62.3	1,333.1	1	53.7	1,967.1	1	76.7	4,832.3
	2	71.5	792.3	2	93.9	1,427.0	2	74.4	2,041.4	2	60.9	4,893.2
	3 [b]		792.3	3	51.7	1,478.7	3	22.1	2,063.5	3	3.8	4,896.9
4-Aug	1	16.7	809.1	1	124.9	1,603.6	1	45.3	2,108.8	1	52.0	4,948.9
	2	60.0	869.1	2	120.0	1,723.6	2	60.0	2,168.8	2	26.0	4,974.9
	3	51.3	920.3	3	82.4	1,806.0	3	53.8	2,222.6	3	145.0	5,119.9
5-Aug	1	40.9	961.2	1	78.9	1,884.9	1	55.1	2,277.8	1	53.8	5,173.7
	2	191.6	1,152.8	2	14.1	1,899.0	2	38.8	2,316.6	2	40.8	5,214.4
	3	2.7	1,155.5	3	78.3	1,977.3	3	56.7	2,373.3	3	80.0	5,294.4
6-Aug	1	12.8	1,168.3	1	116.1	2,093.5	1 [a]		2,373.3	1	44.1	5,338.5
	2	13.8	1,182.1	2	93.3	2,186.8	2		2,373.3	2	43.3	5,381.8
	3	29.3	1,211.4	3	92.9	2,279.7	3		2,373.3	3	148.0	5,529.8
7-Aug	1	47.5	1,258.9	1 [a]		2,279.7	1	55.8	2,429.1	1	136.3	5,666.1
	2	2.8	1,261.6	2		2,279.7	2	68.1	2,497.2	2	57.6	5,723.7
	3	8.4	1,270.0	3		2,279.7	3	19.8	2,516.9	3	51.8	5,775.4
8-Aug	1 [a]		1,270.0	1	77.7	2,357.3	1	21.6	2,538.5	1	94.6	5,870.0
	2		1,270.0	2	64.8	2,422.1	2	74.4	2,612.9	2	221.8	6,091.8
	3		1,270.0	3	49.7	2,471.8	3	41.7	2,654.6	3	98.8	6,190.6
9-Aug	1	5.5	1,275.5	1	85.2	2,556.9	1	38.9	2,693.5	1	120.0	6,310.6
	2	0.0	1,275.5	2	125.7	2,682.6	2	58.1	2,751.6	2	133.3	6,443.9
	3	0.0	1,275.5	3	74.8	2,757.4	3	114.1	2,865.7	3	66.5	6,510.4
10-Aug	1	0.0	1,275.5	1	9.5	2,766.9	1	73.2	2,938.9	1	32.5	6,542.9
	2	8.1	1,283.6	2	54.9	2,821.8	2	29.6	2,968.5	2	98.6	6,641.5
	3	29.3	1,313.0	3	86.0	2,907.8	3	71.3	3,039.8	3	42.6	6,684.1
11-Aug	1	11.3	1,324.2	1	105.8	3,013.6	1	56.8	3,096.6	1 [a]		6,684.1
	2	40.4	1,364.7	2	50.7	3,064.3	2	20.9	3,117.5	2		6,684.1
	3	0.0	1,364.7	3	9.4	3,073.7	3	34.3	3,151.8	3		6,684.1
12-Aug	1	11.3	1,376.0	1	17.9	3,091.6	1	31.3	3,183.1	1	123.3	6,807.4
	2	0.0	1,376.0	2	183.2	3,274.8	2	105.5	3,288.5	2	39.1	6,846.5
	3	0.0	1,376.0	3	0.0	3,274.8	3	56.3	3,344.8	3	28.2	6,874.7

(continued)

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	1993			1994			1995			1996		
Date	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.
13-Aug				1	23.5	3,298.3	1 [a]		3,344.8	1	105.2	6,979.9
				2	10.0	3,308.3	2		3,344.8	2	136.6	7,116.5
				3	3.4	3,311.7	3		3,344.8	3	102.9	7,219.4
14-Aug				1 [a]		3,311.7	1	8.1	3,352.9	1	77.3	7,296.7
				2		3,311.7	2	54.4	3,407.3	2	197.3	7,493.9
				3		3,311.7	3	23.5	3,430.8	3	181.5	7,675.4
15-Aug				1	7.0	3,318.7	1	25.5	3,456.2	1		
				2	8.1	3,326.8	2	18.5	3,474.7	2		
				3	0.0	3,326.8	3	32.0	3,506.7	3		
16-Aug				1	3.3	3,330.1	1	22.9	3,529.5	1		
				2	33.8	3,363.9	2	45.4	3,574.9	2		
				3	11.3	3,375.1				3		
17-Aug				1	0.0	3,375.1				1		
				2	0.0	3,375.1				2		
				3	0.0	3,375.1				3		
18-Aug				1	0.0	3,375.1				1		
				2	0.0	3,375.1				2		
				3	0.0	3,375.1				3		
19-Aug				1	8.3	3,383.4				1		
				2	0.0	3,383.4				2		
				3	3.0	3,386.4				3		
20-Aug				1	0.0	3,386.4				1		
				2	0.0	3,386.4				2		
				3	0.0	3,386.4				3		
21-Aug				1 [a]		3,386.4				1		
				2		3,386.4				2		
				3		3,386.4				3		
22-Aug				1	0.0	3,386.4				1		
				2	0.0	3,386.4				2		
				3	0.0	3,386.4				3		
23-Aug				1	0.0	3,386.4				1		
				2	0.0	3,386.4				2		
				3	0.0	3,386.4				3		
24-Aug				1	0.0	3,386.4				1		
				2	0.0	3,386.4				2		
				3	0.0	3,386.4				3		
25-Aug				1	0.0	3,386.4				1		
				2	2.7	3,389.2				2		
				3	0.0	3,389.2				3		
26-Aug				1	2.8	3,391.9				1		
				2	13.8	3,405.7				2		
				3	0.0	3,405.7				3		
27-Aug				1	2.8	3,408.5				1		
				2	0.0	3,408.5				2		
				3	2.8	3,411.3				3		
28-Aug				1	2.8	3,414.1				1		
				2	0.0	3,414.1				2		
				3	0.0	3,414.1				3		
29-Aug				1	0.0	3,414.1				1		
				2	0.0	3,414.1				2		
				3	0.0	3,414.1				3		
30-Aug				1	0.0	3,414.1				1		
				2		3,414.1				2		
				3						3		

[a] Regular day off.

[b] No drift conducted because of mechanical problems or bad weather.

Table 7. Kobuk River chum salmon drift test fish age and sex composition by week, 1996.

		Brood Year and Age Group					
		1993	1992	1991	1990	1989	
		0.2	0.3	0.4	0.5	0.6	Total
Stratum Dates:	7/9-7/14						
Sampling Dates:	7/9-7/14						
Sample Size:	200						
Female	Percent of Sample	0.0	1.5	30.0	6.5	0.0	38.0
	Number in Catch	0	3	60	13	0	76
Male	Percent of Sample	0.0	8.5	43.0	9.5	1.0	62.0
	Number in Catch	0	17	86	19	2	124
Total	Percent of Sample	0.0	10.0	73.0	16.0	1.0	100.0
	Number in Catch	0	20	146	32	2	200
	Standard Error	0	4	6	5	1	
Stratum Dates:	7/15-7/21						
Sampling Dates:	7/15-7/21						
Sample Size:	314						
Female	Percent of Sample	0.0	6.5	27.1	5.2	0.0	38.9
	Number in Catch	0	21	85	16	0	122
Male	Percent of Sample	0.0	10.3	42.6	8.2	0.0	61.1
	Number in Catch	0	32	134	26	0	192
Total	Percent of Sample	0.0	16.8	69.7	13.4	0.0	100.0
	Number in Catch	0	53	219	42	0	314
	Standard Error	0	7	8	6	0	
Stratum Dates:	7/22-7/28						
Sampling Dates:	7/22-7/28						
Sample Size:	284						
Female	Percent of Sample	0.0	9.5	27.2	3.2	0.0	39.9
	Number in Catch	0	27	77	9	0	113
Male	Percent of Sample	0.7	18.0	36.0	4.6	0.7	60.1
	Number in Catch	2	51	102	13	2	171
Total	Percent of Sample	0.7	27.6	63.3	7.8	0.7	100.0
	Number in Catch	2	78	180	22	2	284
	Standard Error	1	8	8	5	1	
Stratum Dates:	7/29-8/04						
Sampling Dates:	7/29-8/04						
Sample Size:	310						
Female	Percent of Sample	0.0	18.1	27.5	3.6	0.0	49.2
	Number in Catch	0	56	85	11	0	152
Male	Percent of Sample	0.3	21.4	24.6	4.5	0.0	50.8
	Number in Catch	1	66	76	14	0	158
Total	Percent of Sample	0.3	39.5	52.1	8.1	0.0	100.0
	Number in Catch	1	122	162	25	0	310
	Standard Error	1	9	9	5	0	

(continued)

Table 7. (page 2 of 2)

		Brood Year and Age Group					
		1993	1992	1991	1990	1989	
		0.2	0.3	0.4	0.5	0.6	Total
Stratum Dates:	8/05-8/11						
Sampling Dates:	8/05-8/11						
Sample Size:	343						
Female	Percent of Sample	0.6	21.3	32.1	2.0	0.0	56.0
	Number in Catch	2	73	110	7	0	192
Male	Percent of Sample	0.3	21.3	19.2	3.2	0.0	44.0
	Number in Catch	1	73	66	11	0	151
Total	Percent of Sample	0.9	42.6	51.3	5.2	0.0	100.0
	Number in Catch	3	146	176	18	0	343
	Standard Error	2	9	9	4	0	
Stratum Dates:	8/12-8/18						
Sampling Dates:	8/12-8/18						
Sample Size:	182						
Female	Percent of Sample	0.5	21.4	22.0	0.5	0.5	45.1
	Number in Catch	1	39	40	1	1	82
Male	Percent of Sample	0.5	34.6	17.0	2.7	0.0	54.9
	Number in Catch	1	63	31	5	0	100
Total	Percent of Sample	1.1	56.0	39.0	3.3	0.5	100.0
	Number in Catch	2	102	71	6	1	182
	Standard Error	1	7	7	2	1	
Stratum Dates:	7/09-8/18						
Sampling Dates:	7/09-8/18		Season Total				
Sample Size:	1,633						
Female	Percent of Sample	0.2	13.4	28.0	3.5	0.1	45.2
	Number in Catch	3	219	458	57	1	738
Male	Percent of Sample	0.3	18.5	30.3	5.4	0.2	54.8
	Number in Catch	5	303	495	88	4	895
Total	Percent of Sample	0.5	31.9	58.4	8.9	0.3	100.0
	Number in Catch	8	521	953	145	5	1,633
	Standard Error	3	19	20	12	2	

Table 8. Comparison of chum salmon age and sex composition and mean length from the Kobuk and Noatak River drift test fishing catch and the Kotzebue District commercial catch, 1996. [a]

		Brood Year and Age Group					
		1993	1992	1991	1990	1989	
		0.2	0.3	0.4	0.5	0.6	Total
Stratum Dates	7/09-8/18			**Kobuk River**			
Sampling Date	7/09-8/18						
Sample Size:	1,633						
Female	Percent of Sample	0.2	13.4	28.0	3.5	0.1	45.2
	Sample Size	3	219	458	57	1	738
	Mean Length	591.7	598.6	610.6	618.4	645.0	
Male	Percent of Sample	0.3	18.5	30.3	5.4	0.2	54.8
	Sample Size	5	303	495	88	4	895
	Mean Length	570.0	615.0	636.2	635.6	643.0	
Total	Percent of Sample	0.5	31.9	58.4	8.9	0.3	100.0
	Sample Size	8	521	953	145	5	1,633
	Standard Error	3	19	20	12	2	
Stratum Dates	7/28-8/27			**Noatak River**			
Sampling Date	7/28-8/27						
Female	Percent of Sample	0.6	24.6	26.1	3.8	0.0	54.5
	Sample Size	2	85	90	13	0	188
	Mean Length	546.5	592.8	604.4	615.5		
Male	Percent of Sample	0.0	22.6	19.7	3.2	0.0	45.5
	Sample Size	0	78	68	11	0	157
	Mean Length		608.0	630.8	639.4	608.0	
Total	Percent of Sample	0.6	47.2	45.8	7.0	0.0	100.0
	Sample Size	2	163	158	24	0	345
	Standard Error	0	3	3	1	0	
Stratum Dates	7/08						
Sampling Date	8/26			**Kotzebue Commercial Catch**			
Sample Size:	2,386						
Female	Percent of Sample	0.4	20.7	25.4	4.0	0.1	50.4
	Number in Catch	283	16,534	20,262	3,158	46	40,282
	Mean Length	558.2	586.3	606.4	608.2	631.5	
Male	Percent of Sample	0.6	20.0	23.6	5.1	0.4	49.6
	Number in Catch	452	15,983	18,845	4,040	309	39,628
	Mean Length	561.7	608.9	631.6	638.7	642.4	
Total	Percent of Sample	0.9	40.7	48.9	9.0	0.4	100.0
	Number in Catch	735	32,518	39,106	7,197	354	79,910
	Standard Error	156	804	818	468	109	

[a] Lengths are in millimeters and measured from mid-eye to fork-of-tail.

Table 9. Kobuk River drift test fishing climatological data, 1996.

Date	Military Time	Water Level (inches)	Water Level Adjusted to 0	Water Temp. (C)	Secchi (meters)	Wind MPH	Wind Direction	Air Temp. (F) Low	Air Temp. (F) High	Cloud Cover	Precip.
9-Jul	1500	26	0.0	19	4.5	5	east	44	66	1	7
10-Jul	0800	24.5	-1.5	12	5.0	Calm		58	66	2	7
11-Jul	0800	24	-2.0	12	4.0	Calm		62	82	3	7
12-Jul	0800	25	-1.0	14	3.0	5	east	58	68	3	1
13-Jul	0900	25	-1.0	12	2.5	Calm		56	72	3	2
14-Jul	[a]										
15-Jul	0800	29	3.0	15.5	2.5	15	south	52	64	3	7
16-Jul	0800	31.5	5.5	15	2.5	Calm		52	58	3	7
17-Jul	0800	26.5	0.5	15	2.5	5	east	52	65	3	7
18-Jul	0800	26	0.0	14	2.5	5	west	58	70	3	1
19-Jul	0800	25	-1.0	15	3.0	10	west	56	78	2	7
20-Jul	0900	26.5	0.5	14	2.5	5	west	52	68	3	7
21-Jul	0900	24.5	-1.5	15	3.0	5	west	56	56	3	7
22-Jul	0900	23	-3.0	14	3.0	Calm		54	54	4	7
23-Jul	0800	21.5	-4.5	14	3.0	15	east	58	58	1	7
24-Jul	0800	22.5	-3.5	14	2.5	5	west	56	50	4	2
25-Jul	0800	25.5	-0.5	14	2.5	10	west	52	58	4	2
26-Jul	0800	47	21.0	13	1.5	3	west	54	56	4	2
27-Jul	0900	52	26.0	10	0.3	5	west	42	58	4	7
28-Jul	0900	33	37.0	10	0.5	Calm		40	72	2	7
29-Jul	0800	30	59.0	9	0.5	Calm		46	72	2	7
30-Jul	0800	27	56.0	10	0.8	5	east	42	74	1	7
31-Jul	0800	18.5	47.5	10	0.5	10	east	38	62	1	7
1-Aug	0800	23	42.5	10	0.8	5	southeast	50	54	4	2
2-Aug	0900	34.5	45.0	10	1.3	15	southwest	52	52	4	2
3-Aug	0900	52	62.5	9	0.8	5	southeast	42	60	3	0
4-Aug	0800	33.5	70.0	8	1.0	5	southwest	48	60	4	0
5-Aug	0800	34.5	71.0	9	0.8	Calm		44	76	2	0
6-Aug	0900	34	70.5	9	1.0			44	80	2	.7
7-Aug	0800	28	64.5	9	1.5	10	southeast	44	60	3	7
8-Aug	0800	19.5	56.0	10	1.5	5	southwest	48	52	4	2
9-Aug	0800	20	49.0	10	2.0	Calm		44	68	2	7
10-Aug	0900	26	48.0	9	1.5	Calm		44	74	1	7
11-Aug	[a]										
12-Aug	0900	20	42.0	9	2.0	5	northeast	40	72	1	7
13-Aug	0900	21.5	37.5	10	2.5	10	southwest	48	60	3	7
14-Aug	0900	19.5	35.5	10	2.5	5	southwest			4	1

[a] Regular day off.

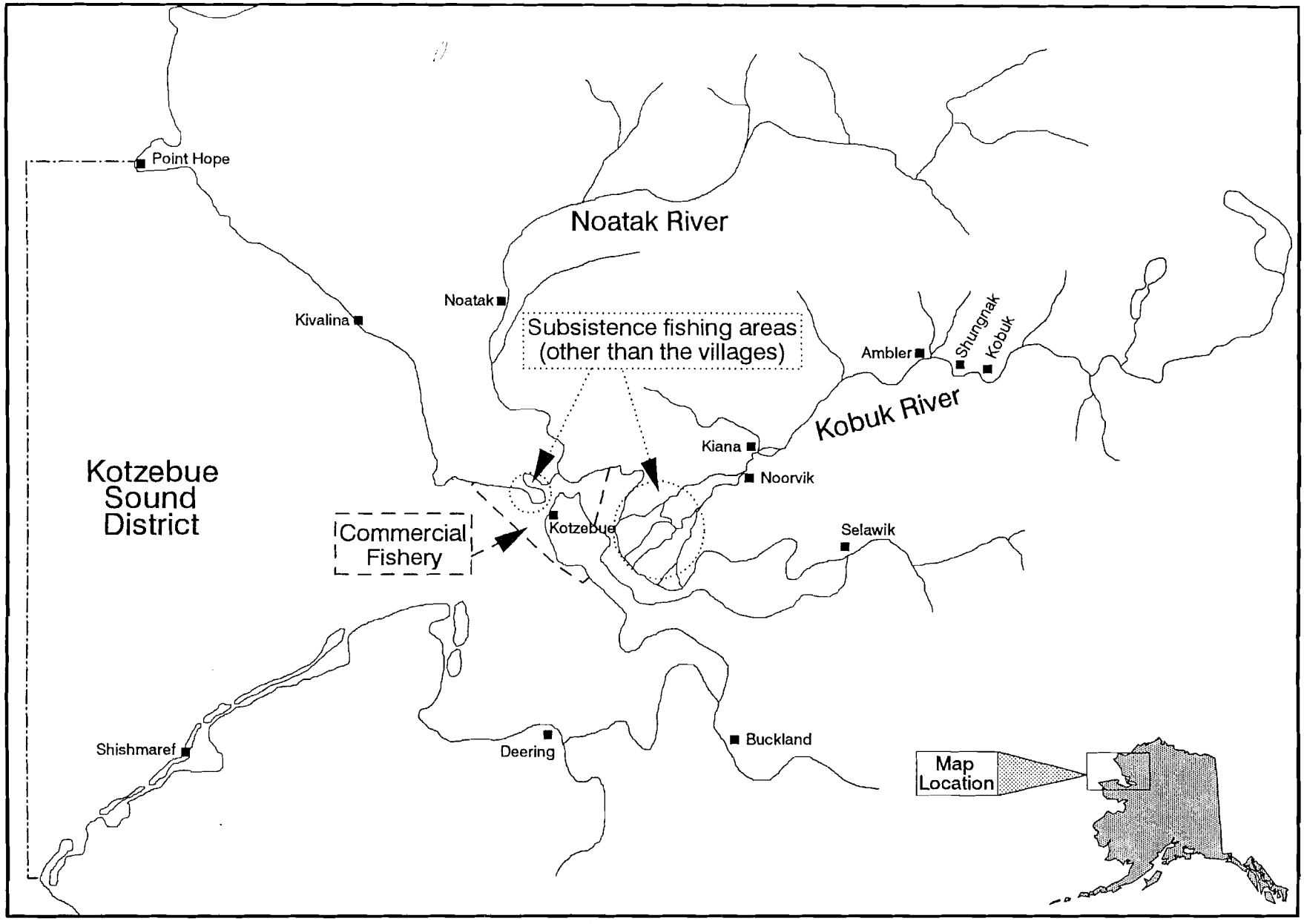

Figure 1. Kotzebue Sound commercial fishing district, villages and subsistence fishing areas.

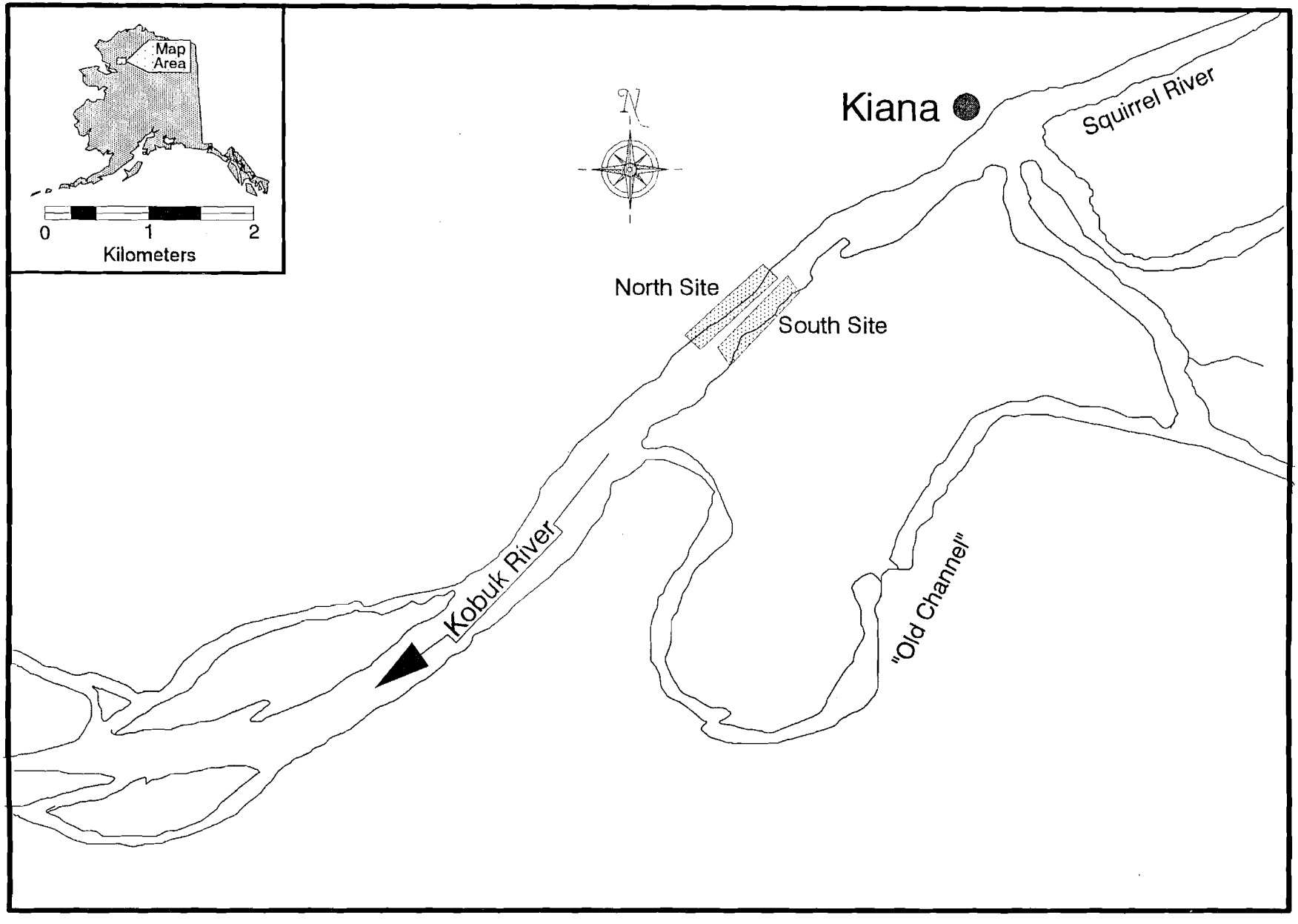

Figure 2. Lower Kobuk River drift test fishing sites.

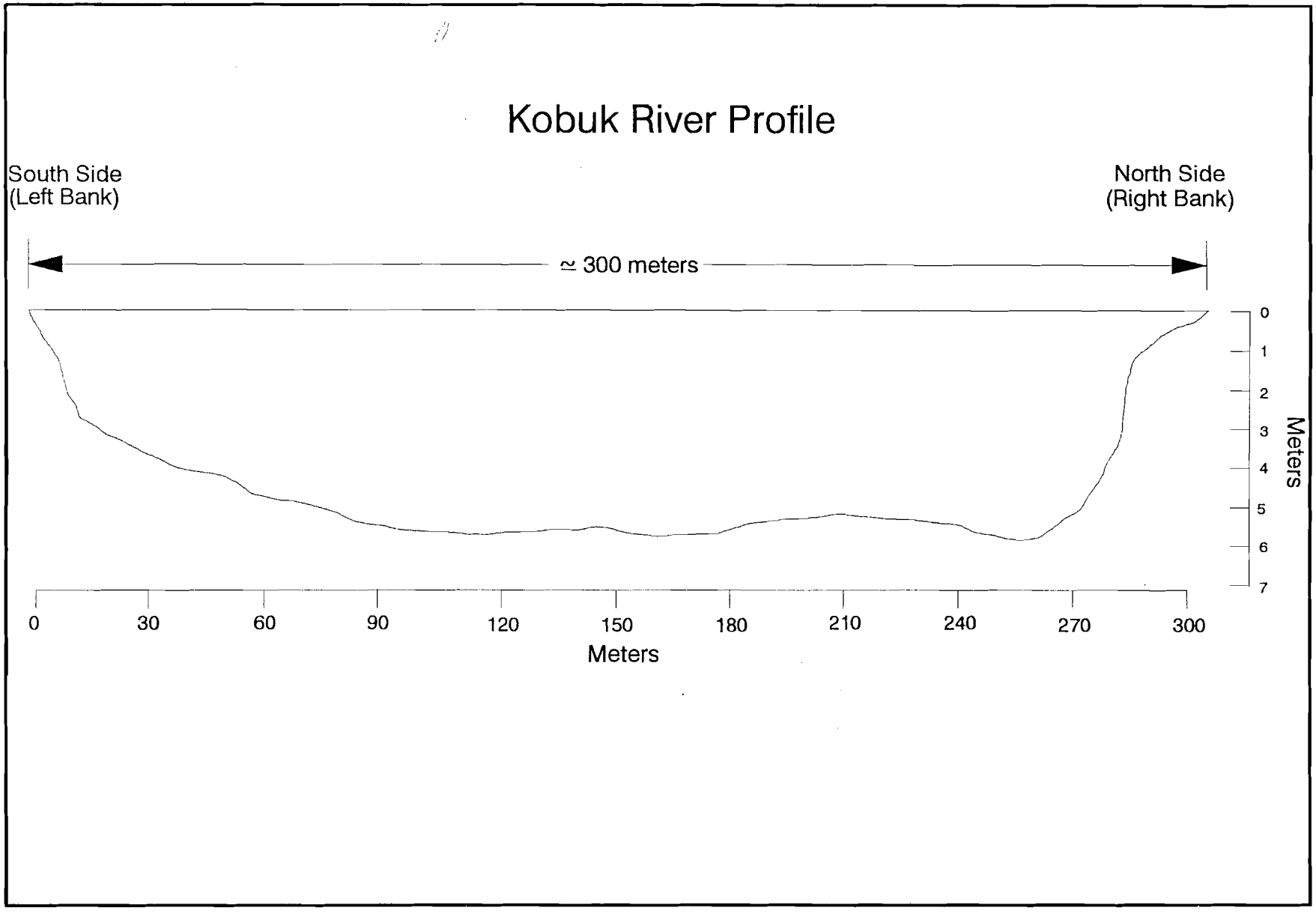

Figure 3. Kobuk River bottom profile at the test fishing site, August 1, 1996.

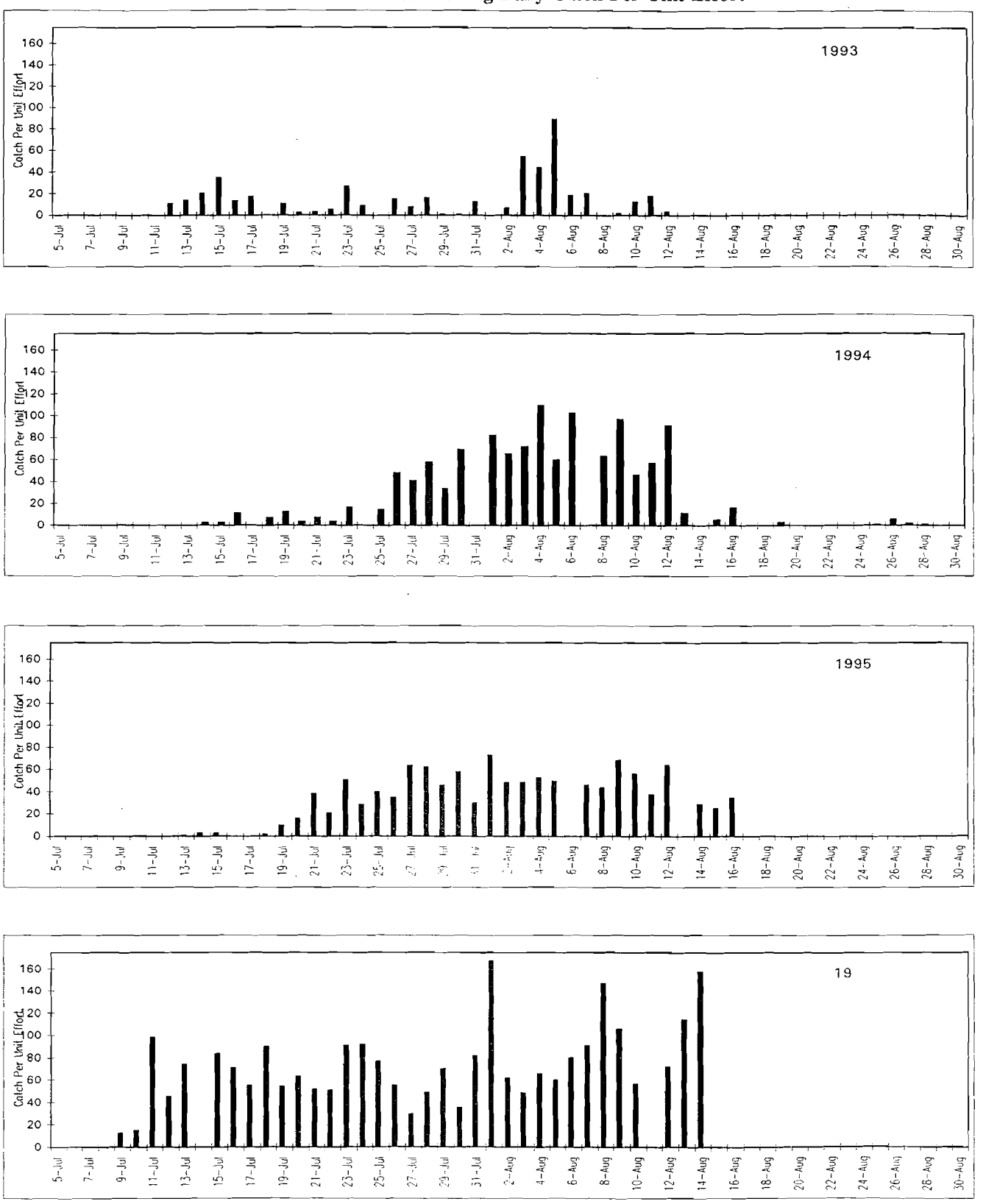

Figure 4. Kobuk River chum salmon drift test fish daily CPUE, 1993-1996.

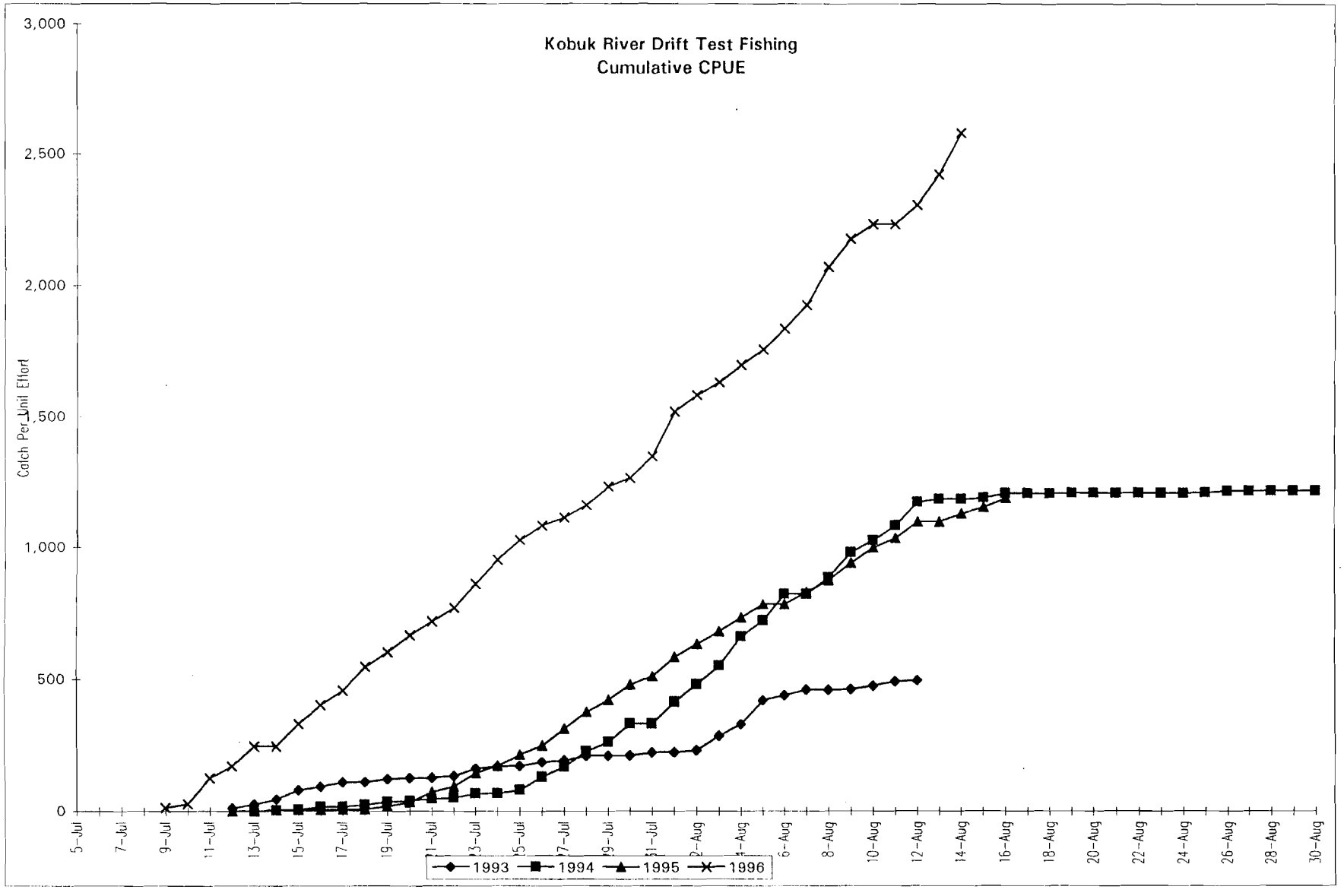

Figure 5. Kobuk River chum salmon drift test fishing cumulative CPUE, 1993-1996.

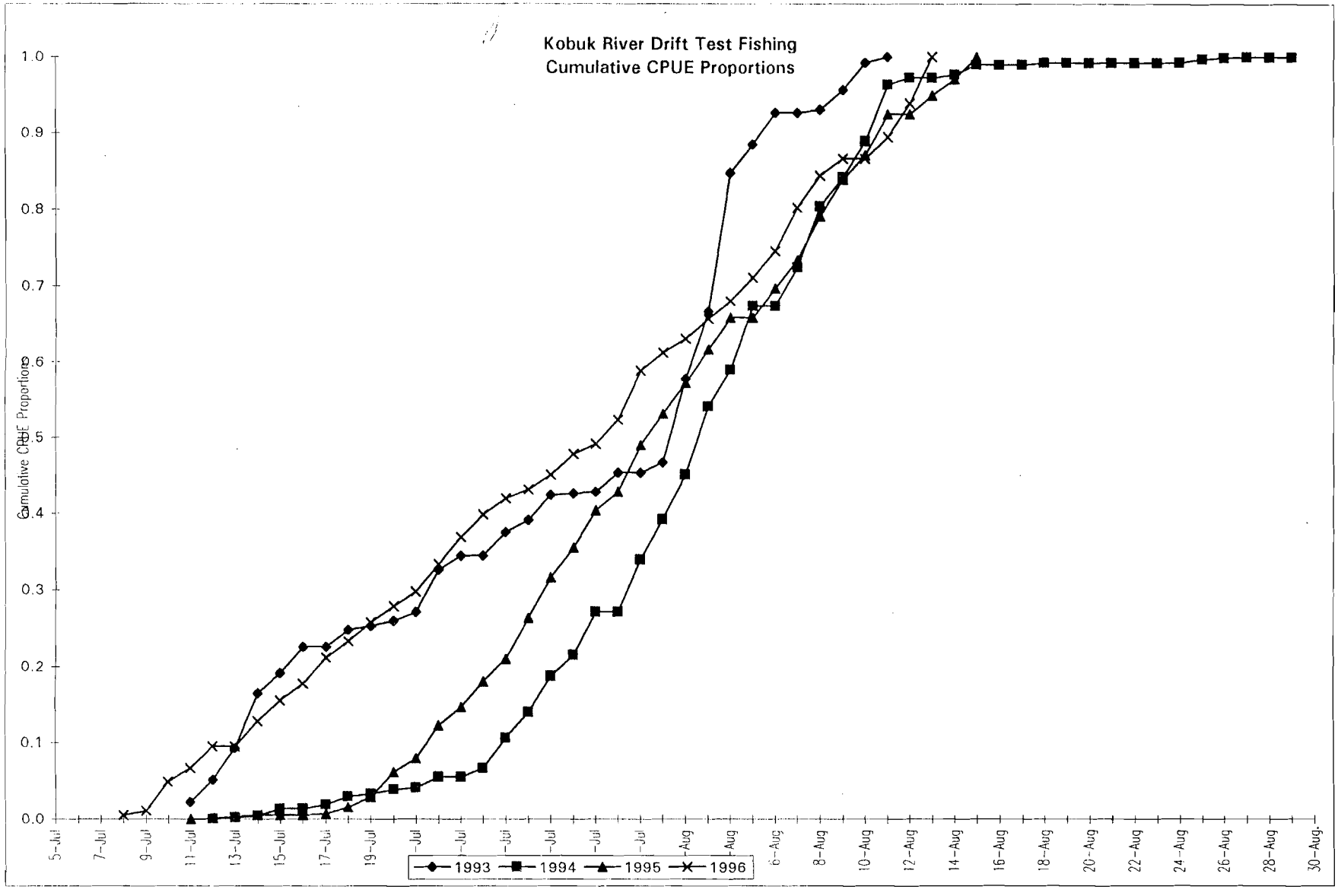

Figure 6. Kobuk River chum salmon drift test fishing cumulative CPUE proportions, 1993-1996.

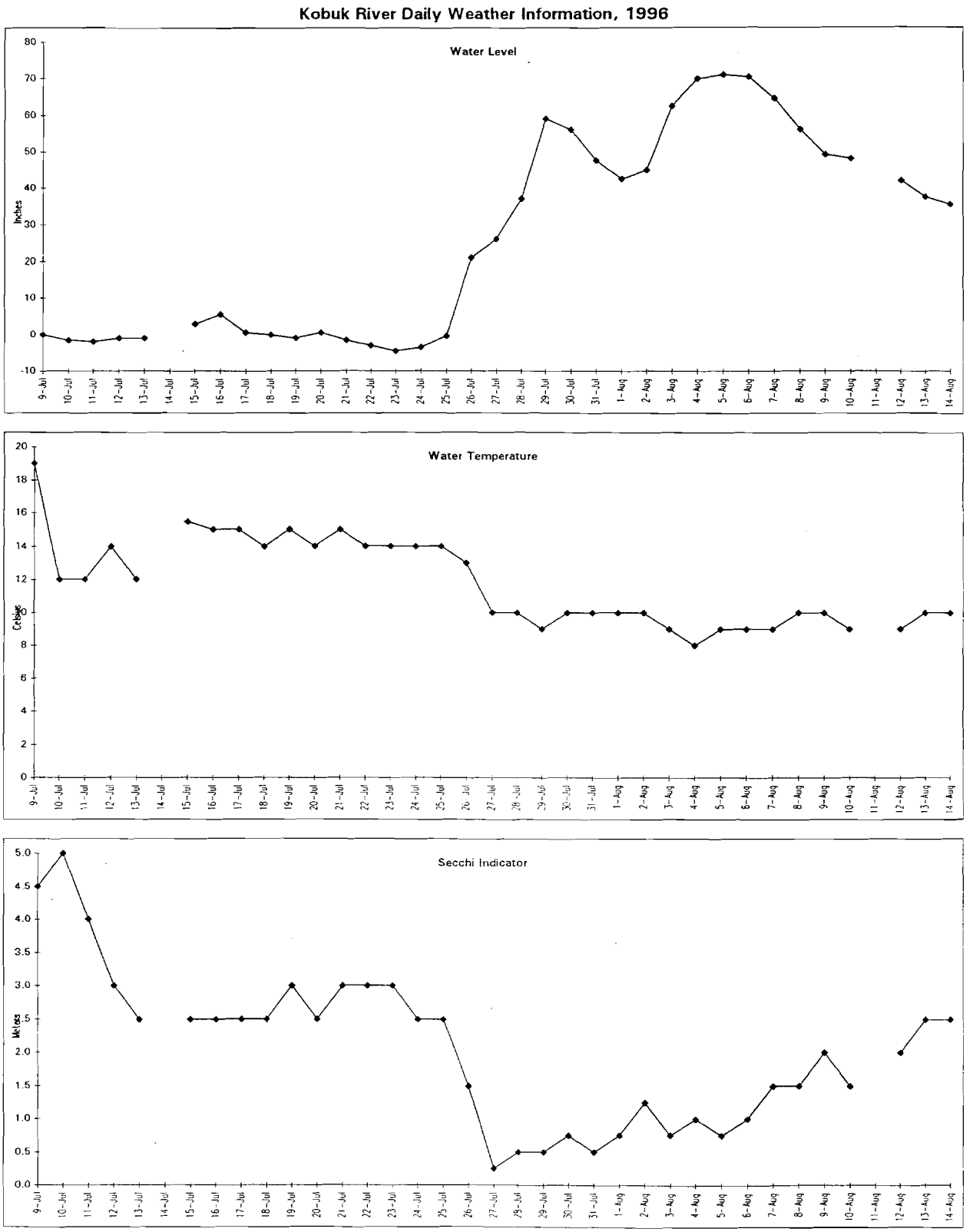

Figure 7. Kobuk River test fish site water depth, water temperature and secchi indicator by day, 1996.

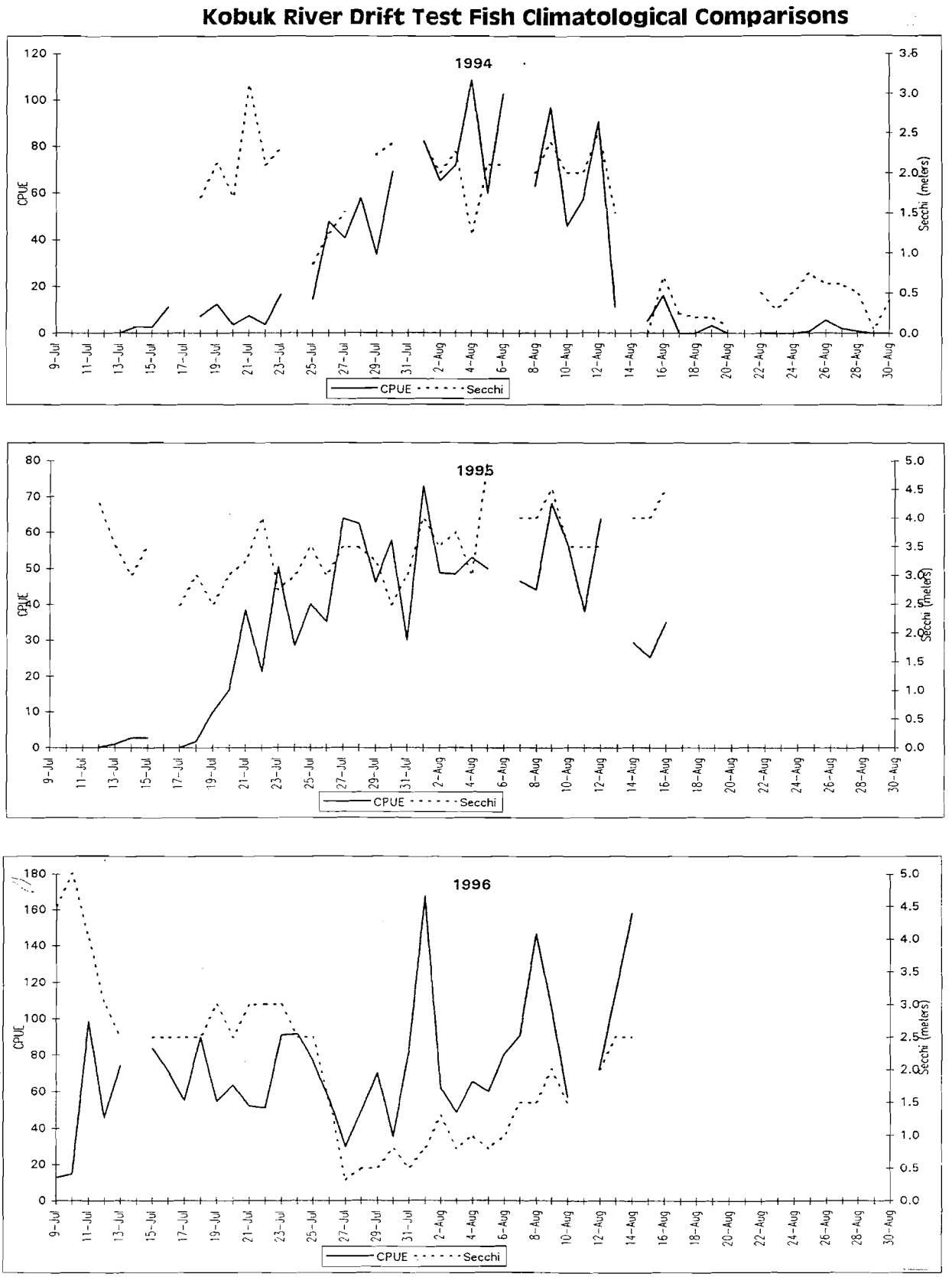

Figure 8. Kobuk River chum salmon daily CPUE compared to daily secchi readings, 1994-1996.